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seem unadapted for investigating this question; and I would hope that some worthy successor of Baily and Sheepshanks, will with special means undertake to investigate a question which is absolutely necessary to complete the theory of pendula and standards of length and capacity.

Recent Observations and Remarks of Hofrath Schwabe regarding Sun-spots and other Solar Phenomena.

Communicated by W. De la Rue, B. Stewart, and B. Loewy.

About two months ago Hofrath Schwabe called our attention to certain phenomena on the surface of the Sun, which he had noticed since last December and which he recollected to have occurred before, but only at the time of a minimum in the number of Sun-spots. The phenomena are:—1st. *A total absence of faculæ or faculous matter.* 2nd. *Absence of the usually observed scars, pores, and similar appearances.* 3rd. *An equal brightness of the whole surface, the limb being as luminous as the centre.*

Hofrath Schwabe desired us to go over his observations, which are at present at Kew Observatory, to extract similar facts formerly noticed, and to inform him whether some of these phenomena had also been observed in this country.

The observations were carefully scanned; and it was noticed that the phenomena occur only in years of minimum spot-frequency. The extracts, which we append, and which might have been multiplied, are quite sufficient to show the regularity of their recurrence, and also that the year 1833 was particularly characterized by the frequency of observations of them.

We also applied to the Rev. F. Howlett, whose well-known exquisite delineations of Sun-spots and faculæ gave us the best promise of learning something more relating to delicate changes on the surface of the Sun; but unfortunately Mr. Howlett's impaired health has obliged him to withdraw almost wholly from his usual application to Sun observations during the period in question. He however states in his answer, that "he had certainly noticed how uniformly bright the Sun's surface has been of late, in connection with an almost total absence of faculæ."

We think it right to state (without expressing our own opinion in the matter) that Hofrath Schwabe thinks he has noticed a connexion between Sun-spots and meteoric showers. He says in his last letter, "The minimum of spot-frequency coincides remarkably with the recurrence of meteoric showers, the period of rotation of which, viz., 33·2 years, agrees with a larger period of the sun-spots. In 1833 there was an extreme scarcity of spots (only 33 very small groups being observed),

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and in 1866–67, after 33 years the phenomenon repeats itself. From the 1st January until to-day, June 8th, I have only observed 6 small groups, and out of 133 days of observation, there were 100 without spots. In the year 1848, which is the middle of the 33·2 years period, there was a maximum of spots. If the 33 years' period should be established by future observations, then a maximum of meteoric showers would always occur after three years of the usual Sun-spot periods. Whether this periodicity existed before, I cannot decide, but there appears to have been a minimum of Sun-spots in 1798·5, and a maximum in 1816·8."

We are at present engaged in determining a curve of spot-frequency during the last forty years, founded, not on the *number of observed groups*, but on the *area of spotted surface*, as observed by Hofrath Schwabe; and we hope that by this means the periodicity will be represented with greater precision than before, and also that more light will be then thrown on the whole subject; but in the meantime we would call the attention of all observers to the fact, that in the present state of our inquiries into the physical nature of the Sun and into the connexion of cosmical phenomena, even the most delicate changes observed deserve great attention, and that nothing should be overlooked by those who take an active interest in this problem.

June 14, 1867.

Extracts from Hofrath Schwabe's own Observations.

1833.	
February 6, 7	.. Surface of the Sun extremely uniform, and hardly any trace of faculæ and scars.
March 5	.. No faculæ. Sun spotless and without any scars.
April 6	.. A few indistinct scars. No pores observable.
,, 7	.. Sun spotless. Scars extremely minute. No pores.
,, 22	.. Surface very uniform; five scars, no faculæ and pores.
,, 23	.. Surface quite uniform, without faculæ. Similar observations until May 4th.
May 12, 13 ..	.. Sun spotless, very uniformly bright and faculous matter very minute.
,, 14, 15 ..	.. Sky not quite clear; Sun spotless, no faculæ or pores to be seen.
,, 20, 24, 25, 30	.. Surface very uniform, with minute scars. No faculous clouds.
June 7, 8, 11 ..	.. Spotless, very uniform, without faculæ. Towards the end of the month the scars more distinct and a few faculæ visible.
July 8, 16, 18, 29	.. Spotless, surface very uniformly bright. Similar remarks during August, September, October, December, and during the beginning of 1834.

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1844.	
February 9	The surface of the Sun appears very uniform, without considerable faculæ.
,, 12	Perfectly spotless; no faculæ near the limbs, nor scars in the centre. Throughout February no faculæ.
March 6, 30, 31	Spotless, very uniform, finely porous with a few minute scars.
April 2, 3, 5	A few cumuli of faculous matter, but no spots, points or pores.
May 12	No spots or faculæ. Similar observations until the end of September.
1855.	
February 23	Sun spotless; no faculæ, although many pores and fine points are observable.
June, July, and August ..	Sun spotless, surface extremely distinct, no faculæ, but innumerable pores and minute dots.

Note on the Spectrum of Comet II. 1867.

By William Huggins, Esq., F.R.S.

Observations of this Comet were made on May 4th and 8th. In the telescope the comet appeared to consist of a slightly oval coma surrounding a minute and not very bright nucleus. This bright point was not central, but nearer to the *following* edge of the coma.

When the spectroscope was applied to the telescope, a continuous spectrum was formed by the light of the coma. I was unable, on account of the faintness of the nucleus, to distinguish with certainty the spectrum of its light from the broad spectrum of the coma on which it appeared projected. Once or twice I suspected the presence of two or three bright lines, but of this observation I was not certain.

The prismatic observation of this faint object, though imperfect, appears to show that this small comet is probably similar in physical structure to Comet I, 1866.*

Since some recent researches appear to suggest the existence of a possible connexion between some objects which have the appearance of comets and the phenomenon of periodical meteors, additional interest and importance are given to any observations which may help us to a better knowledge of these mysterious bodies.

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* See *Proceedings Royal Society*, Vol. xv. p. 5.